

WHAT IS CLAIMED IS:

1. A method of operating an equalizer which is provided in a digital communications receiver to reduce symbol decoding errors therein and which has a feed forward digital filter defined by a plurality of feed forward coefficients and a feedback digital filter defined by a plurality of feedback coefficients, comprising:

determining initial values for a subset of said coefficients without determining initial values for the remainder of said coefficients;

thereafter, in response to the initial values of the subset of said coefficients, determining subsequent values for the subset of said coefficients and also for the remainder 10 of said coefficients; and

based on the subsequent values of said coefficients, using the equalizer to decode symbols that have arrived at the receiver in a digital transmission burst.

2. The method of Claim 1, wherein said step of determining initial values includes using a first coefficient determination algorithm to determine the initial values, and wherein said step of determining subsequent values includes determining the subsequent values according to a second coefficient determination algorithm that differs from said first coefficient determination algorithm.

3. The method of Claim 2, wherein the first coefficient determination algorithm is more computationally complex than the second coefficient determination algorithm.
4. The method of Claim 3, wherein the first coefficient determination algorithm includes one of a Least Squares algorithm and a Weighted Least Squares algorithm.
5. The method of Claim 4, wherein the second coefficient determination algorithm includes a Least Mean Squares algorithm.
6. The method of Claim 3, wherein the second coefficient determination algorithm includes a Least Mean Squares algorithm.
7. The method of Claim 1, wherein said step of determining initial values includes determining initial values for a subset of the feed forward coefficients without determining initial values for the remainder of the feed forward coefficients.

8. The method of Claim 7, wherein said step of determining initial values includes determining initial values for the feedback coefficients in response to the initial values of the subset of feed forward coefficients.

5 9. The method of Claim 8, wherein said step of determining subsequent values includes determining the subsequent values in response to the initial values of the subset of feed forward coefficients and the initial values of the feedback coefficients.

10 10. An equalization apparatus for reducing symbol decoding errors in a digital communications receiver, comprising:

a feed forward digital filter having an input for receiving digital transmission bursts, said feed forward digital filter defined by a plurality of feed forward coefficients;

15 a decision element having an input coupled to said feed forward digital filter for deciding what symbols are included in the received digital transmission bursts, said decision element having an output for providing a signal indicative of the decided symbols;

a feedback digital filter having an input coupled to said output of said decision element for filtering said signal indicative of the decided symbols, said feedback digital filter having an output for providing a filtered version of said signal, said output of said feedback

digital filter coupled to said input of said decision element, said feedback digital filter defined by a plurality of feedback coefficients; and

a coefficient determiner coupled to said feed forward filter and said feedback filter for determining initial values for a subset of said coefficients without determining initial values for the remainder of said coefficients, and for thereafter determining subsequent values for the subset of said coefficients and also for the remainder of said coefficients in response to the initial values of the subset of said coefficients, said coefficient determiner having an output coupled to said feed forward digital filter and said feedback digital filter for first outputting said initial coefficient values to said filters and for thereafter outputting said subsequent coefficient values to said filters.

11. The apparatus of Claim 10 wherein said coefficient determiner includes a coefficient initializer selectively connectable to said feed forward digital filter and said feedback digital filter for using a first coefficient determination algorithm to determine said initial values for said subset of coefficients, said coefficient determiner further including a subsequent coefficient calculator for determining said subsequent coefficient values according to a second coefficient determination algorithm that differs from said first coefficient determination algorithm.

12. The apparatus of Claim 11, wherein said first coefficient determination algorithm is more computationally complex than said second coefficient determination algorithm.

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13. The apparatus of Claim 12, wherein said first coefficient determination algorithm includes one of a Least Squares algorithm and a Weighted Least Squares algorithm.

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14. The apparatus of Claim 13, wherein said second coefficient determination algorithm includes a Least Mean Squares algorithm.

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15. The apparatus of Claim 12, wherein said second coefficient determination algorithm includes a Least Mean Squares algorithm.

16. The apparatus of Claim 11, wherein said coefficient initializer includes a feed forward coefficient calculator for determining initial values for a subset of the feed forward

coefficients without determining initial values for the remainder of the feed forward coefficients.

17. The apparatus of Claim 16, wherein said coefficient initializer includes a feedback coefficient calculator coupled to said feed forward coefficient calculator for determining initial values for the feedback coefficients in response to the initial values of the subset of feed forward coefficients.

10 18. The apparatus of Claim 17, wherein said subsequent coefficient calculator is responsive to the initial values of the subset of feed forward coefficients and the initial values of the feedback coefficients for determining said subsequent coefficient values.

15 19. The apparatus of Claim 10, wherein said feedback digital filter includes a finite impulse response filter and said feed forward digital filter includes a finite impulse response filter.

20. A method of operating an equalizer which is provided in a digital communications receiver to reduce symbol decoding errors therein and which has a feed

forward digital filter defined by a plurality of feed forward coefficients and a feedback digital filter defined by a plurality of feedback coefficients, comprising:

using a first coefficient determination algorithm to determine respective first values for selected ones of said coefficients;

using a second coefficient determination algorithm to determine respective second values for the selected ones of said coefficients, wherein said second coefficient determination algorithm differs from said first coefficient determination algorithm; and

based on the coefficient values determined in one of said using steps, using the equalizer to decode symbols that have arrived at the receiver in a digital transmission burst.

10 21. The method of Claim 20, wherein said step of using a first algorithm includes using the first algorithm determine respective first values for a subset of said coefficients without using the first algorithm to determine values for the remainder of said coefficients.

15 22. The method of Claim 20, wherein the first and second algorithms differ in computational complexity.

23. The method of Claim 22, wherein the first coefficient determination algorithm includes one of a Least Squares algorithm and a Weighted Least Squares algorithm

24. The method of Claim 23, wherein the second coefficient determination algorithm includes a Least Mean Squares algorithm.

25. An equalization apparatus for reducing symbol decoding errors in a digital communications receiver, comprising:

a feed forward digital filter having an input for receiving digital transmission bursts, said feed forward digital filter defined by a plurality of feed forward coefficients;

a decision element having an input coupled to said feed forward digital filter for deciding what symbols are included in the received digital transmission bursts, said decision element having an output for providing a signal indicative of the decided symbols;

a feedback digital filter having an input coupled to said output of said decision element for filtering said signal indicative of the decided symbols, said feedback digital filter having an output for providing a filtered version of said signal, said output of said feedback digital filter coupled to said input of said decision element, said feedback digital filter defined by a plurality of feedback coefficients; and

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a coefficient determiner coupled to said feed forward filter and said feedback filter for using a first coefficient determination algorithm to determine respective first values for selected ones of said coefficients, and for using a second coefficient determination algorithm to determine respective second values for the selected ones of said coefficients, wherein said second coefficient determination algorithm differs from said first coefficient determination algorithm, said coefficient determiner having an output coupled to said feed forward digital filter and said feedback digital filter for outputting said first coefficient values to said filters and for outputting said second coefficient values to said filters.

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